ENVIRONMENTAL ASSESSMENT
Fisheries Division
Montana Fish, Wildlife and Parks
Rock Creek Channel Reconstruction and Fishery Restoration Project

General Purpose: The 1995 Montana Legislature enacted statute 87-1-272 through 273 which directs the Department to administer a Future Fisheries Improvement Program. The program involves physical projects to restore degraded fish habitat in rivers and lakes for the purposes of improving wild fisheries. The legislature established a funding account to help accomplish this goal. This project is being proposed to restore one mile of channel within the Rock Creek drainage located approximately 18 miles west of the town of Lincoln. The intent of the project is to re-establish migratory corridors for native fish between the North Fork of the Blackfoot River and headwater reaches of the watershed and to provide improved spawning and rearing habitat for trout.

I. **Location of Project:** This project will be conducted on Rock Creek, a tributary to the North Fork of the Blackfoot River, located approximately 18 miles west of the town of Lincoln within Township 14 North, Range 11 West, Section 5 in Powell County (see Attachment 1).

II. **Need for the Project:** Department Goal A indicates that a Fisheries Division objective is to "protect existing aquatic habitat and improve degraded stream systems for the welfare of healthy fish populations and other wildlife species and for public enjoyment and use." The Future Fisheries Improvement Program is a tool to help achieve that objective.

Rock Creek is the main tributary to the lower North Fork of the Blackfoot River. Rock Creek and its tributaries have been a focus of significant restoration efforts over the last several years. Rock Creek contains native westslope cutthroat trout and bull trout, as well as non-native rainbow trout and brown trout. Approximately 65% of Rock Creek is in a degraded condition except in areas where habitat restoration and riparian management measures recently have occurred. Past livestock grazing practices have severely impacted the stream, resulting in an over-widened and extremely shallow channel. This project proposes to enhance spawning and rearing habitat for salmonids by narrowing and deepening the channel; installing large woody debris and boulders into the channel to create pools and overhead cover; transplanting sod on newly created stream banks; planting woody riparian vegetation; and managing livestock grazing within the riparian corridor. The project also is expected to improve the migratory corridor for salmonids, especially for native westslope cutthroat trout and bull trout.

III. **Scope of the Project:** The proposal calls for restoring approximately 0.70 miles of Rock Creek and 0.30 miles of a southern unnamed tributary (see Attachment 2). The proposed project is broken into four reaches: Reach 1- from county road to first gradient break where the valley widens; Reach 2 - bottom of Reach 1 to the lower-most rock check dam; Reach 3 - lower check dam to existing stock pond dam; and Reach 4 - stock pond dam to boundary fence. Proposed treatments for Reach 1 include narrowing and deepening some over widened channel segments; installing boulders to create pool habitat; and placing log structures such as vanes, deflectors and overhead cover to improve overall habitat. Work in Reach 2 calls for adjusting the channel

morphology to narrow, deepen and increase sinuosity; placing boulders and large woody debris (root wads, log vanes, downstream deflectors) for overhead cover and habitat structure; transplanting sod on newly formed banks; and planting shrubs within the riparian zone. Restoration in Reach 3 would involve removal of a stock pond dam; total reconstruction of the channel and creation of a floodplain; installation of boulders and large woody debris; sod transplants; and the planting of riparian shrubs. Additionally, a low dam would be constructed on the southern unnamed tributary. Fill needed for floodplain construction within Reach 3 would be obtained by deepening the proposed pond, as well as utilizing the material generated from the removal of the existing stock dam. The newly created pond would include a step pool outlet to provide for upstream fish passage. In Reach 4, a new narrow and deep channel would be constructed and woody debris and rock would be installed to maintain stability and provide pool habitat. For all four reaches, an overall strategy for livestock grazing will be implemented to provide for recovery of the riparian vegetation. The project is expected to cost $63,200.00. Of this total, the Future Fisheries Improvement Program would be contributing up to $27,660.00.

IV. Environmental Impact Checklist:

Please see attached checklist.

V. Explanation of Impacts to the Physical Environment:

1. Terrestrial and aquatic life and habitats.

The restoration of approximately one mile of Rock Creek and an adjacent unnamed tributary would improve salmonid habitat. The proposed project calls for lengthening the stream channel and converting the existing stream profile consisting primarily of a shallow riffle to a section containing a diversity of pools, riffles and runs. Increasing channel diversity would enhance habitat for the benefit all salmonid life stages. As a result, trout populations within this restored segment of Rock Creek would be expected to increase. Additionally, the proposed restoration would tend to reduce water temperatures, thereby benefiting the native bull trout and westslope cutthroat trout populations. Restoration of the riparian corridor through the planting of woody shrubs and through changes in grazing management would improve habitat for riparian dependent wildlife species.

2. Water quantity, quality and distribution.

Short term increases in turbidity will occur during project construction. To minimize turbidity, construction will occur during a low flow period and operation of equipment in the stream channel will be minimized to the extent practicable. A permit for a short term exemption from turbidity will be obtained from the Water Quality Bureau and a 310 permit will be obtained from the local Conservation District. In the long term, protecting the riparian corridor from overgrazing, planting native woody shrubs within the riparian zone and stabilizing eroding stream banks would reduce the contribution of sediment and nutrients to downstream areas. As a result, the water quality of Rock Creek and

downstream waters would be expected to improve.

3. Geology and soil quality, stability and moisture.

No effects on geology and soils are expected above the high water mark. Below the high water mark, the project is expected to create a more stable stream channel. Sediment removed from the channel would be placed on newly created banks and stabilized with transplanted sod. The restored channel would be stabilized by seeding and by planting native woody shrubs along the stream banks. Proper grazing management within the riparian corridor would allow the vegetative community, especially the woody shrubs, to recover and would help insure bank stability.

4. Vegetation cover, quantity and quality.

Riparian vegetation and cover would be improved by adopting a proper livestock grazing strategy for the riparian corridor, spreading seed and trans-planting sod on the disturbed stream banks, and planting shrubs along the stream corridor. The riparian vegetation would be protected from overgrazing by excluding livestock grazing within the riparian pasture for the first three years following completion of the project and then adopting an appropriate grazing management plan thereafter.

5. Aesthetics.

Aesthetics would be enhanced by restoring a degraded reach of stream to a more healthy and natural stream environment. A one mile reach of stream would be restored by converting the existing channel morphology from a wide shallow riffle to a diverse channel consisting of riffles, runs and pools. The riparian vegetative community would be enhanced by protecting the stream-side corridor from over-grazing, planting native shrubs within the riparian zone and seeding and trans-planting sod on disturbed stream banks.

7. Unique, endangered, fragile, or limited environmental resources.

The Rock Creek drainage contains native bull trout and westslope cutthroat trout. Bull trout have been listed under the Endangered Species Act and westslope cutthroat trout recently have been petitioned for listing. The proposed project is expected to help restore a historic migration corridor for cutthroat trout and bull trout to provide access to headwater reaches. The project is also expected to improve recruitment of salmonids, including bull trout and cutthroat trout, to the North Fork of the Blackfoot River and mainstem Blackfoot River.

9. Historic and archaeological sites

The proposed project will likely require an individual Army Corp of Engineers (COE) 404 permit. Therefore, the State Historic Preservation Office has been contacted to

determine the need for compliance with the federal historic preservation regulations. The project will not begin until a cultural clearance is granted.

VI. Explanation of Impacts on the Human Environment.

7. Access to & quality of recreational activities.

It is anticipated that the restoration of one mile of channel within the Rock Creek drainage would improve overall aquatic habitat and, as a result, would improve recruitment of trout to the North Fork of the Blackfoot River and mainstem Blackfoot River. As a result, the recreational fishery in the North Fork and mainstem would be expected to improve.

VII. Discussion and Evaluation of Reasonable Alternatives.

1. No Action Alternative

If no action is taken, a one mile segment of the Rock Creek drainage will remain degraded. The channel will remain a uniform, shallow and wide riffle with limited habitat. As a result, recruitment of juvenile fish to downstream waters will remain below potential. In addition, habitat for riparian dependent wildlife will remain in a degraded condition. Recreational opportunities associated with fish and wildlife resources will remain reduced and aesthetics will continue to be impaired.

2. The Proposed Alternative

The proposed alternative is designed to enhance spawning, rearing and adult habitat for salmonids in the Rock Creek drainage by adjusting channel morphology within over-widened portions of the stream, enhancing the riparian vegetative community, and appropriately managing livestock grazing within the riparian corridor. These activities would create a more diverse habitat for aquatic life and riparian dependent wildlife. This alternative would improve fish and wildlife habitat, aesthetics and water quality within the project area and would be expected to increase trout populations in Rock Creek, the North Fork of the Blackfoot River and the mainstem Blackfoot River.

VIII. Environmental Assessment Conclusion Section

1. Is an EIS required? No.

We conclude from this review that the proposed activities will have a positive impact on the physical and human environment.

2. Level of public involvement.

The proposed project was reviewed and supported by the public review panel of

the Future Fisheries Improvement Program. The proposed project also will be reviewed by the Fish, Wildlife and Parks Commission and will be contingent upon their approval. The Environmental Assessment (EA) is being distributed to all individuals and groups listed on the cover letter. The EA will be published on the Montana Electronic Bulletin Board.

3. Duration of comment period?

Public comment will be accepted through 5 P.M. on October 5, 1998.

4. Person responsible for preparing the EA.

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ENVIRONMENTAL ASSESSMENT

Project Title Rock Creek Channel Reconstruction and Fishery Restoration Project
Division/Bureau Fisheries Division -Future Fisheries Improvement
Description of Project This project is being proposed to restore approximately 1.0 mile of channel within the Rock Creek drainage located about 18 miles west of the town of Lincoln. The intent of the project is to help re-establish a migratory corridor for native fish from the North Fork of the Blackfoot River to headwater reaches of the watershed and to provide improved spawning, rearing and adult habitat for native westslope cutthroat trout and bull trout, as well as for non-native rainbow trout and brown trout.

POTENTIAL IMPACT ON PHYSICAL ENVIRONMENT

	MAJOR	MODERATE	MINOR	NONE	UNKNOWN	COMMENTS ON ATTACHED PAGES
1. Terrestrial & aquatic life and habitats		X				X
2. Water quality, quantity & distribution			X			X
3. Geology & soil quality, stability & moisture			X			X
4. Vegetation cover, quantity & quality			X			X
5. Aesthetics			X			X
6. Air quality				X		
7. Unique, endangered, fragile, or limited environmental resources			X			X
8. Demands on environmental resources of land, water, air & energy				X		
9. Historical & archaeological sites				X		X

POTENTIAL IMPACTS ON THE HUMAN ENVIRONMENT

	MAJOR	MODERATE	MINOR	NONE	UNKNOWN	COMMENTS ON ATTACHED PAGES
1. Social structures & mores				X		
2. Cultural uniqueness & diversity				X		
3. Local & state tax base & tax revenue				X		
4. Agricultural or industrial production				X		
5. Human health				X		
6. Quantity & distribution of community & personal income				X		
7. Access to & quality of recreational and wilderness activities			X			X
8. Quantity & distribution of employment				X		
9. Distribution & density of population & housing				X		
10. Demands for government services				X		
11. Industrial & commercial activity				X		
12. Demands for energy				X		
13. Locally adopted environmental plans & goals				X		
14. Transportation networks & traffic flows				X		

Other groups or agencies contacted or which may have overlapping jurisdiction North Powell County Conservation District, Army Corp of Engineers, State Historical Preservation Office

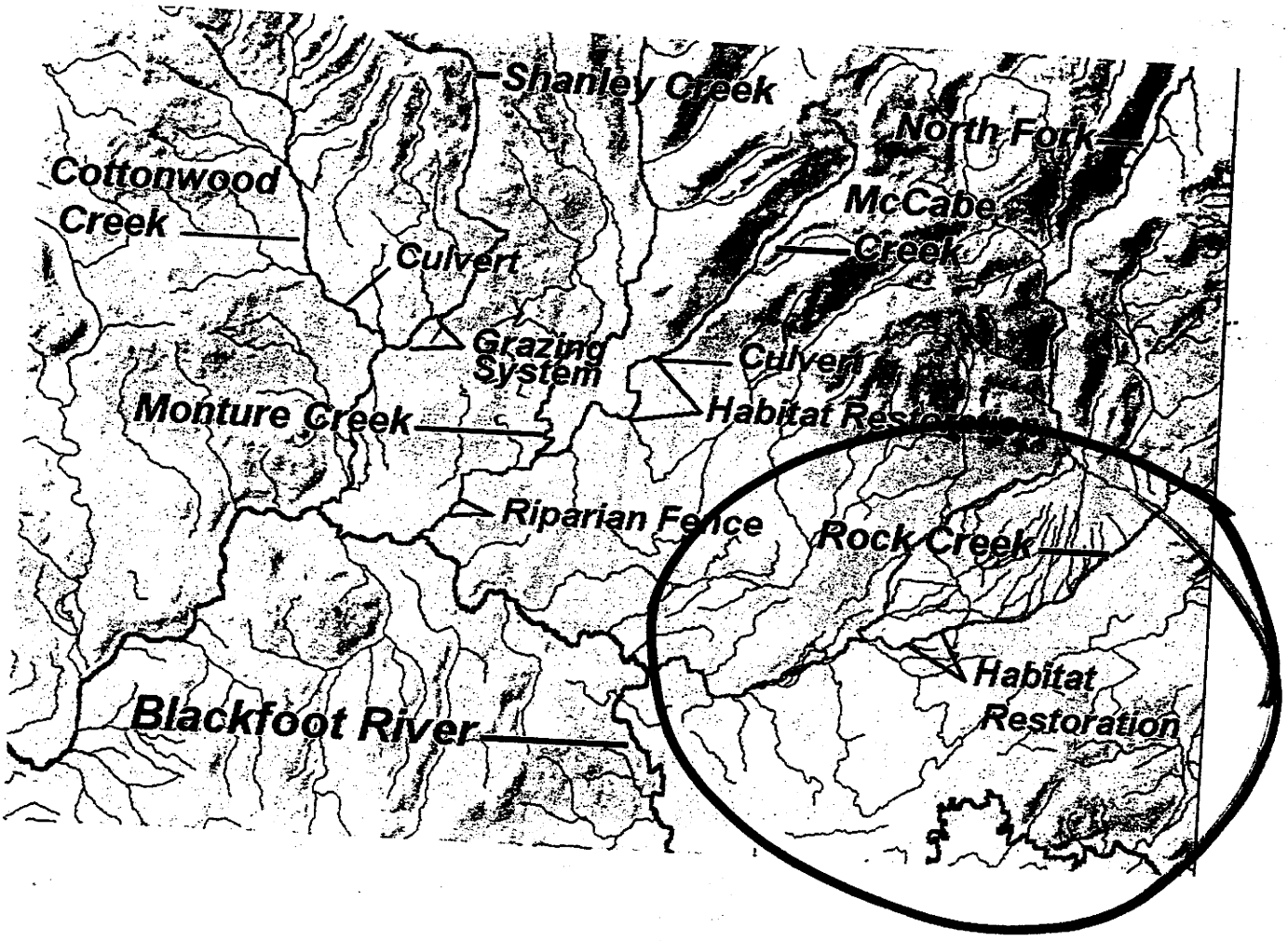
Individuals or groups contributing to this EA: Ron Pierce, MFWP; Gary Decker, WestWater Consultants, Inc.

Recommendation concerning preparation of EIS: No EIS required.

EA prepared by : Mark Lere

Date: September 3, 1998

ATTACHMENT 1



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Proposal for Stream Restoration of Rock Creek near Ovando, MT

Introduction

Rock Creek near Ovando is a spring creek tributary to the North Fork Blackfoot River draining in from the east side of the River. Considerable restoration has already occurred on this stream both upstream and downstream from the proposed reach. The project reach has been heavily impacted by grazing and stock pond construction in the past. Montana Fish Wildlife and Parks would like to restore this reach of Rock Creek to provide spawning and rearing habitat for all trout species associated with the North Fork Blackfoot River. This proposal will outline recommended treatments and provide cost estimates for the proposed project including, design, construction, revegetation and oversight.

Existing and Proposed Channel Conditions

A field review of the proposed project was conducted with MT FWP in mid-June, 1998. At that time numerous cattle were grazing the stream bottoms and terraces, which were thought to be in trespass. It is important to note that this restoration proposal will only be successful if a grazing strategy is developed that is compatible with riparian recovery.

Rock Creek is formed by spring seeps in an old river or flood channel incised into the broad alluvial outwash plain called Kleinschmidt Flat. The upper reaches of the project area occurs in a narrow valley bottom with shallow gravel deposits and has numerous boulders exposed. As the valley widens, it also flattens and the boulders are buried in finer deposits of cobble and gravels. The stream also accumulates additional spring flows as it flows downstream such that the lower reaches have at least double the flow of the upper reaches. A number of rock check dams have been constructed recently and one large stock pond dam was constructed in the distant past. Within the area that is seasonally flooded by the stock dam, the steam is simply a broad flat gravel bed area that is heavily impacted by cattle. The streambanks are non-existent and flow pattern is primarily sheet flow. Temperatures are most certainly elevated through the entire project area, but primarily in the ponded areas.

The project area was divided into 4 Reaches based on the existing conditions and proposed treatments. The attached aerial photo and sketch illustrates the Reaches and a conceptual plan view of the proposed project. The reaches are divided as follows:

Reach 1: from the county road on the eastern boundary (upstream terminus) down to the first gradient break where the valley widens;

Reach 2: from Reach 1 downstream to the lowermost rock check dam;

Reach 3: from the lower check dam downstream to the existing stock pond dam;

Reach 4 from the stock pond dam downstream to the boundary fence.

Reach 1 is in the best condition of all reaches within the project area. Existing length is about 500 feet and is mostly a B3 and E3a streamtype. This reach is in the narrowest valley bottom with the largest substrate exposed. The stream through this reach is somewhat overwidened and habitat is limited to primarily riffles and cascades. Riparian vegetation is affected, but most components appear to remain and should be viable if rested. Large woody debris is completely lacking in the entire stream.

Proposed treatments for this reach are to narrow and deepen some the overwidened areas and convert this reach into an E3b streamtype with a bankfull width of about 6 to 8 feet. Existing boulders can be used to create more pool habitat and low steps within the channel. Log structures such as vanes, downstream deflectors and over head cover can be added to improve overall habitat. This reach, with minor work, should recover to potential within 2 to 3 years. A pattern similar to that displayed on the aerial photo would accelerate recovery to its potential and would increase total channel length to about 600 feet (an increase of about 100 feet).

Reach 2 occurs where the valley begins to widen and gradient decreases somewhat. The stream changes to a C4 and E4 streamtype, and the channel is overwidened from trampling and bank damage. The potential streamtype is an E4 streamtype with a low width:depth ratio, deep pools and a bankfull width of abut 8 to 10 feet. The stream is about twice as wide as it should be for an E4 channel in this setting (see attached conceptual cross section). Sinuosity is lower than normal and meander is lengthened due to the overwidened channel. Habitat is primarily riffle, with few pools and no woody debris present. The riparian area is heavily altered, with few shrubs remaining and sedges trampled into poor condition.

This reach needs some reconstruction to narrow, deepen and increase sinuosity. For the most part, the work can be accomplished within the current active channel, but some meanders would need to be extended to provide the proper meander geometry. Most sod transplants could be used from on site, and existing rock could be used to add structure and pools to the reach. Large woody debris should be added in the form of root wad bank structures, log vanes, downstream deflectors and overhead cover. This reach should have additional shrubs transplanted and "staked" into the riparian area to provide long term stability, cover and woody debris. The shrub plantings should be protected from browsing by deer and other animals with individual fencing. Unit costs for the proposed work would be about twice the cost of Reach 1. Total stream length would increase from the existing 1500 feet to about 1800 feet.

Reach 3 occurs downstream between the last rock check dam and the stock pond dam, including the side tributary draining in from the south. This stream through this reach is completely altered by backwater from the stock pond and grazing use. The flow pattern is primarily sheet flow over existing gravel deposits.

This reach needs total reconstruction and will likely need some fill and a quantity of sod transplants to create a stable and productive E4 streamtype. The new stream channel, with a bankfull width of about 10 to 12 feet, could be partially excavated within the existing gravel flat and streambanks created with transplanted sod mats. Fill would need to be placed between the sod streambanks and the valley walls to create a floodplain and wetland area typical of E4 stream valleys (see attached conceptual cross section). Woody debris and rock structures should be incorporated similar to Reach 2 to provide pool habitat and overhead cover. Sod transplants are available in two adjacent locations (see aerial photo). Since the landowner desires a pond somewhere in this reach, it is proposed to construct a low dam on the southern tributary upstream from the existing stock dam as shown in the sketch. Fill could be provided by deepening this proposed pond location and also from the existing stock dam, which would need to be removed. All disturbed areas and fill placements should be seeded, mulched and planted with shrub containerized stock and shrub stakes. Like Reach 2, the shrub plantings should be fenced to protect them from browsing.

The same treatment should be applied to the side tributary from the new dam to its confluence with the main stream. A step-pool channel is also proposed at the outlet of the new pond to provide fish passage upstream. The step pool channel should be constructed from rock and log placements. Unit costs for Reach 3 will be about 2 to 3 times higher than Reach 2. Stream length would be increased from about 780 feet of shallow riffle to about 1320 feet of E4 stream channel.

Reach 4 is similar to Reach 2, but is in worse condition. It is greatly overwidened and is primarily a shallow riffle throughout the reach. Some mature shrubs are present in low numbers. This reach would also need to be completely rebuilt into an E4 streamtype, but would not require as much extensive work as Reach 3. A new narrow and deep channel with a bankfull width of about 10 to 12 feet could be excavated within the active channel system and streambank constructed from transplanted sod mats. Wood and rock structures should be added to maintain stability and provide pool habitat similar to the remainder of the channel system. Some minor amounts of fill would likely be required to rebuild the floodplain. Like Reach 3, the disturbed areas and fill placements should be seeded, mulched, and planted with shrubs. Unit costs for Reach 4 will be less than Reach 3, but higher than Reaches 1 and 2. Total channel length would be increased from about 600 feet to 900 feet.

Summary of Project Features and Approximate Material Needs

Total straight line project distance	3000 feet
Existing stream/pond length	3360 feet
Proposed Stream length	4600 feet
Total fill needed	1600 cubic yards
whole trees - 10" to 20" diameter	70 trees
Sod transplants -	0.5 acre or 22,200 sq feet
Rock - as needed and on site	
New or enhanced wetlands	5.5 acres

Estimated Equipment Time and Other Costs

Excavator - Komatsu 150-200 class - 34 days @ $800/day	$ 27,200
Wheeled Loader - Komatsu 320 class - 15 days @ $600/day	$ 9,000
Trucks - 1 off road or 2 standard dump - 6 days @ $500/day	$ 3,000
Mobilization	$ 600
Containerized shrub stock - 1 gallon size - 500 @ 300/ea	$ 1,500
Seed/ Mulch and Misc.	$ 1,000
Total Equipment and Materials Costs	**$ 42,300**
Data collection and design including mileage	$ 2,500
Staking and Construction supervision -	
Hydrologist - 10 days @ $600/day	$ 6,000
Technician - 6 days @ $400/day	$ 2,400
Total Design and Construction Supervision (including per diem and mileage)	**$ 10,900**
Total Estimated Project Costs	**$ 53,200**

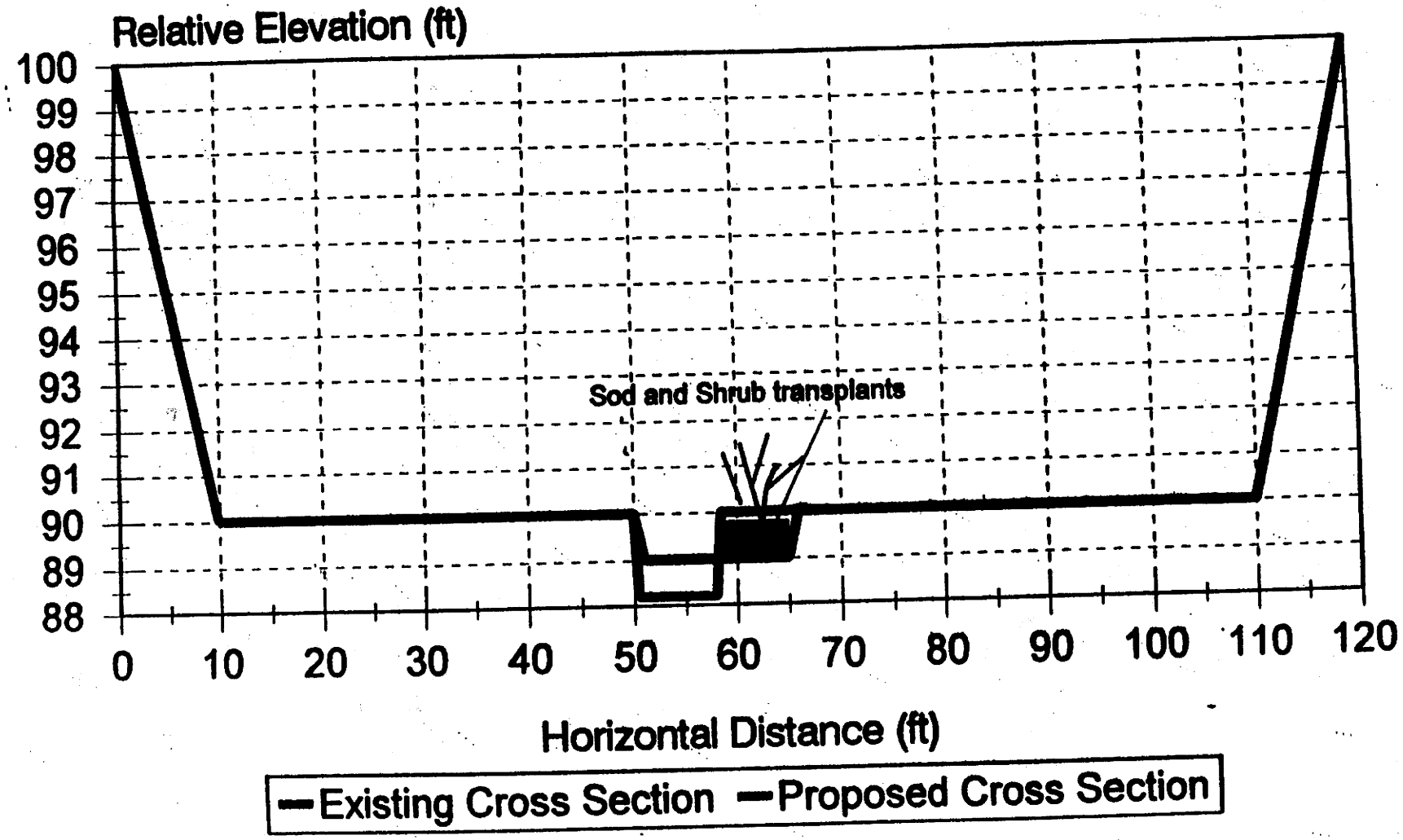
Cost per linear foot of channel = $ 11.56, about average for this size stream.

Benefits of the project

Benefits would be numerous, including adding significant lengths of stream channel with greatly improved salmonid habitat. Instream habitat would be converted from primarily shallow riffle to a wide diversity of pools, runs, riffle and steps that would provide for all life stages. Fish populations would probably increase dramatically the first few years and leveling off at much higher densities. Riparian areas would be enhanced and set to recovery normal healthy riparian function. Wetlands would be increased and enhanced which would benefit riparian wildlife species. Water temperature would be reduced significantly, which would favor bull trout and Westslope cutthroat trout. Land values should also increase substantially. Grazing could be provided at low levels in the future with careful management, but the entire system would require 3-5 years rest.

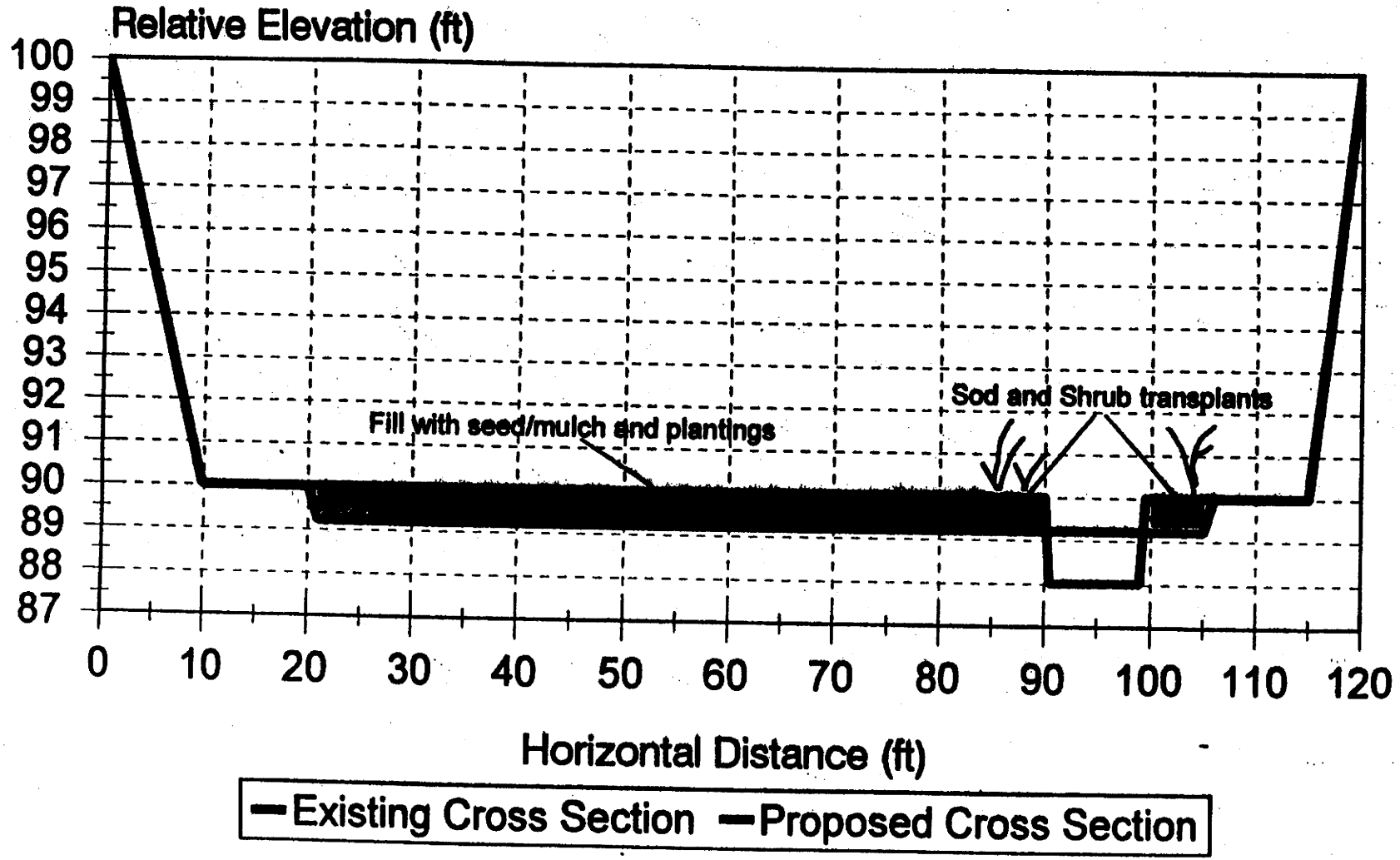
Conceptual Cross Section

Reach 2



Conceptual Cross Section

Reach 3



Step pool
Fill Borrow Area
Sod Borrow Area
Sod Borrow Area
Reach 2
Reach 2